that the aquatic plants have the most extended area. Setting books aside, I have been able to follow this species from station to station, by means of the authentic specimens deposited in the herbaria, in Asia, Oceania, Africa, and America. In Africa it extends without interruption from Bône (in Algeria) to the Cape of Good Hope, over 61 degrees of latitude, and in longitude from the mouths of the Senegal to the islands of Mauritius and Réunion—that is to say, over 73 degrees. In Asia I have myself collected this plant in the marshes of Alexandretta in Syria, and it may be traced into India as far as Ceylon, and across the archipelago of the Philippines and the Sunda Islands as far as the south of Australia. This area includes 112 degrees of longitude and 73 degrees of latitude. In America the extreme points are, in the north Kentucky, and in the south the Rio de la Plata, giving 72 degrees; and from east to west Mexico and Bahia, or 60 degrees of longitude.

Thus *Jussiæa repens* occupies a broad band passing all round the globe, of which the two extreme borders parallel to the equator, in the northern and southern hemispheres, are distant each 35 degrees from the equinoctial line.

Further investigations pursued in the same spirit will probably show that this example is not isolated; and already M. Ernest Cosson* has indicated an aquatic grass, *Leersia hexandra*, Swartz, the geographical extension of which is not less, and its botanical synonymy equally complicated.—*Comptes Rendus*, 9th July, 1866, pp. 39–41.

Note on a Regular Dimerous Flower of Cypripedium candidum. By Asa Gray.

Mr. J. A. Paine, junr., of New York, who two years ago detected an interesting monstrosity of *Pogonia ophioglossoides*, has now brought to me, preserved in spirit, a monstrous blossom of *Cypripedium candidum*, which demands a record.

The plant bears two flowers: the axillary one is normal; the terminal one exhibits the following peculiarities. The lower part of the bract forms a sheath which encloses the ovary. The labellum is wanting; and there are two sterile stamens, the supernumerary one being opposite the other, *i. e.* on the side of the style where the labellum belongs. Accordingly the first impression would be that the labellum is here transformed into a sterile stamen. The latter, however, agrees with the normal sterile stamen in its insertion as well as in shape, being equally adnate to the base of the style. Moreover the anteposed sepal is exactly like the other, has a good midrib and an entire point. As the two sterile stamens are anteposed to the two sepals, so are the two fertile stamens to the two petals, and the latter are adnate to the style a little higher than the former. The style is longer than usual, is straight and erect; the broad, disciform stigma therefore faces upwards; it is oval and symmetrical, and a light groove across its middle shows it to be

* Flore Algérienne, 4to, t. i. p. 18.

dimerous. The placentæ, accordingly, are only two. The groove on the stigma and the placentæ are in line with the fertile stamens.

Here, therefore, is a symmetrical and complete, regular but dimerous orchideous flower, the first verticil of stamens not antheriferous, the second antheriferous, the carpels alternate with these; and here we have clear (and perhaps the first direct) demonstration that the orchideous type of flower has two stamineal verticils, as Brown always insisted.—*Silliman's Journal*, September 1866.

Boussingault's Researches on the Action of Foliage.

A full abstract of the first part of these investigations, communicated to the French Academy of Sciences, is given in the 'Comptes Rendus,' vol. lx. no. 18 (May 1865). Theodore Saussure had long ago ascertained that, while plants prosper and decompose carbonic acid gas in an atmosphere containing as much as one-twelfth or even one-eighth part of that gas, they promptly perish in unmixed carbonic acid, apparently without decomposing any of it. Boussingault made his experiments in a better form, upon leaves only, avoiding all complication of the action of the roots or other parts of the plant. His results are:—

1. That leaves exposed to sunshine in pure carbonic acid do not decompose this gas at all, or only with extreme slowness.

2. But in a mixture with atmospheric air, they decompose carbonic acid rapidly. The oxygen of the atmospheric air, however, appears to play no part.

3. Leaves decompose carbonic acid in sunshine as readily when this gas is mixed with nitrogen or with hydrogen.

Although this decomposition of carbonic acid by green foliage must be a case of dissociation—a separation of carbon from oxygen—yet Boussingault recognizes an analogy here with an opposite phenomenon, viz. with the slow combustion of phosphorus at the ordinary temperature. Phosphorus in pure oxygen emits no light, does not sensibly undergo combustion, but does so in a mixture of oxygen with atmospheric air, or with nitrogen, hydrogen, or carbonic acid. The analogy may even be carried further; for while a stick of phosphorus is not phosphorescent in pure oxygen at ordinary or increased pressure, it becomes so in rarified oxygen. And Boussingault equally ascertained that leaves which exerted no sensible action upon pure carbonic acid at ordinary pressure, decomposed it, with the liberation of oxygen gas, under diminished pressure. That is, rarefaction and mixture with an inert gas act alike in mechanically separating the atoms, whether of carbonic acid, as in the one case, or of oxygen, as in the other, so as to determine the action either of combination or of dissociation.

In a continuation of these investigations (Comptes Rendus, vol. lxi., Sept. 25, 1865), Boussingault shows that carbonic oxide, whether pure or diluted, is not decomposable by foliage, and that this inertness of green foliage upon carbonic oxide goes to confirm the opinion maintained in his 'Economie Rurale,' that leaves simultaneously de-